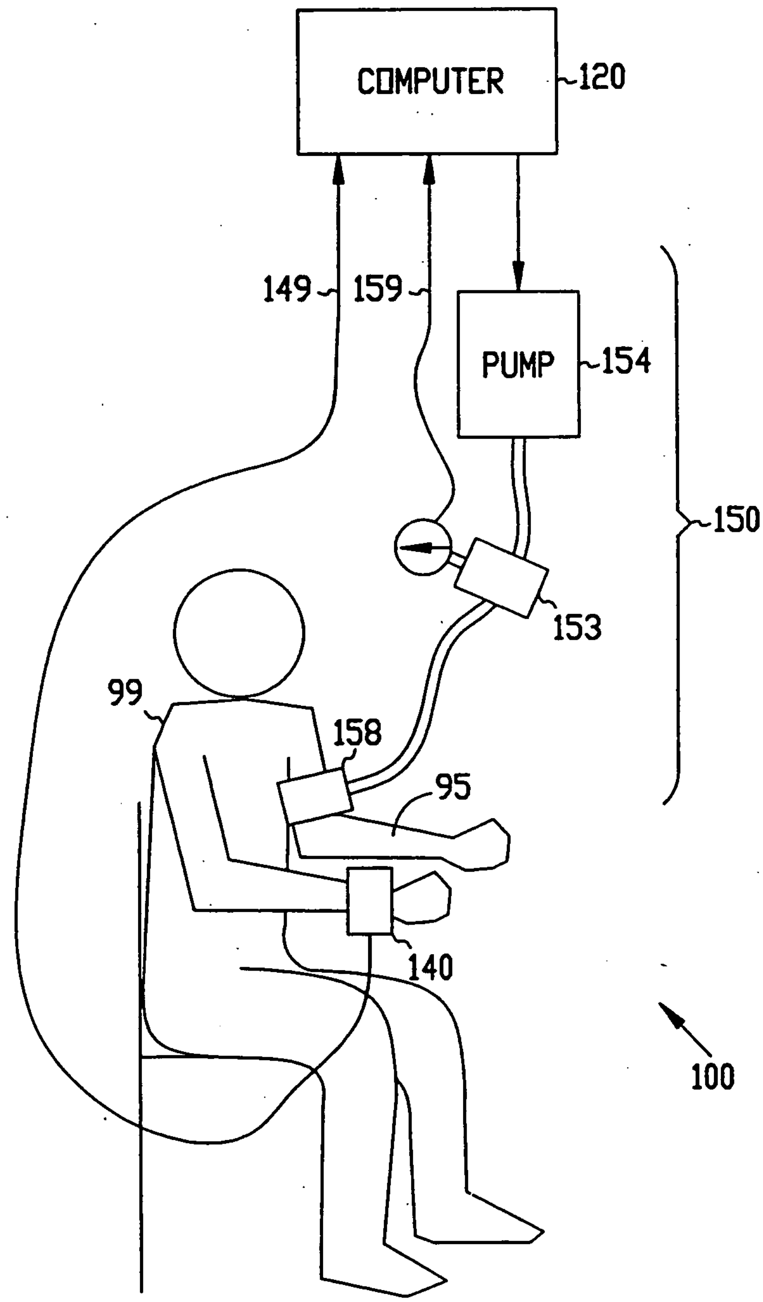


FIG. 1A

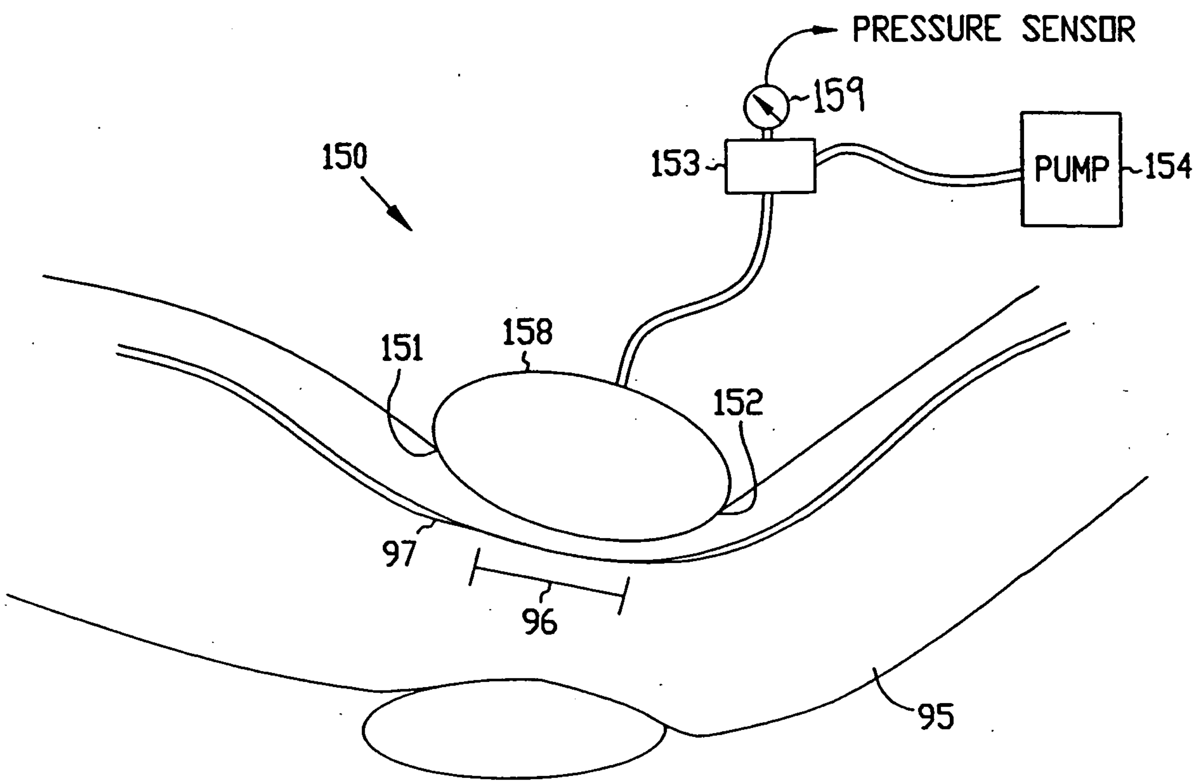

PRESSURE SENSOR
159
150
153
PUMP
154
151
158
152
97
96
95

FIG. 1B

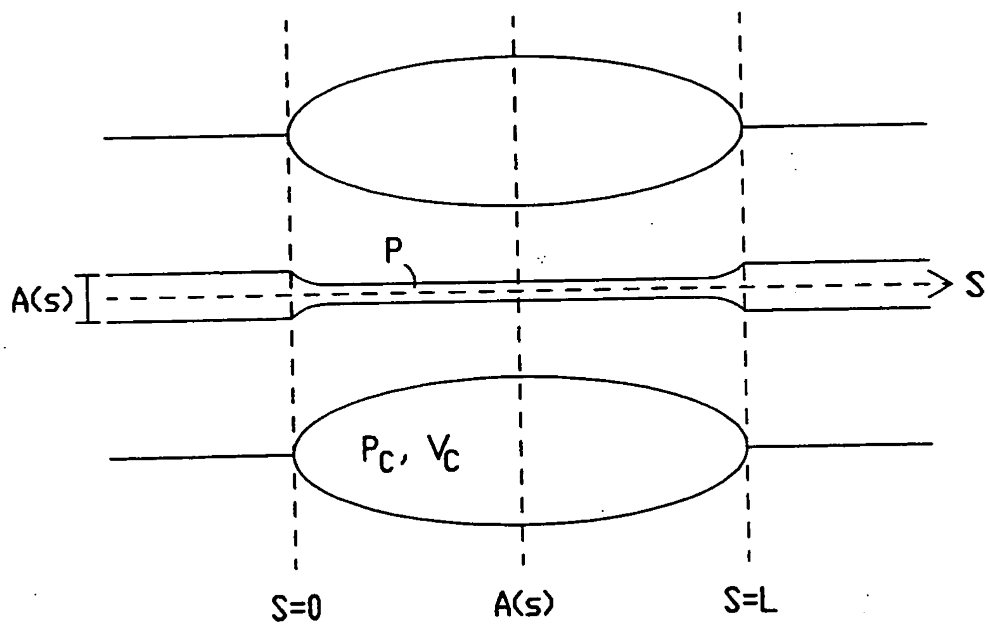

P
A(s)
S
P_C, V_C
S=0
A(s)
S=L

FIG. 1C

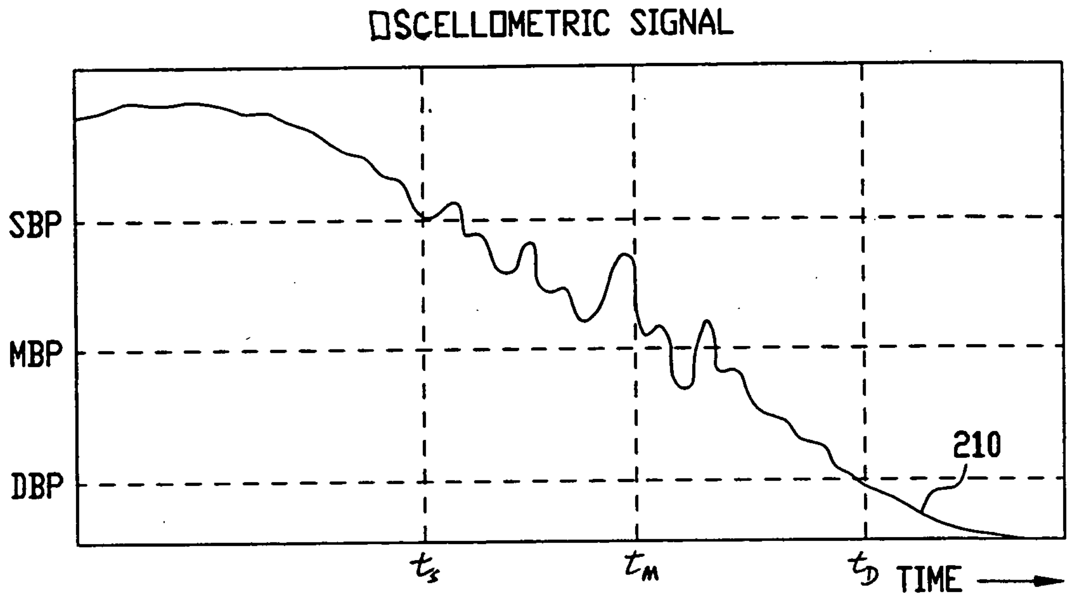

OSCELLOMETRIC SIGNAL
SBP
MBP
DBP
210
t_s
t_M
t_D
TIME

FIG. 2A

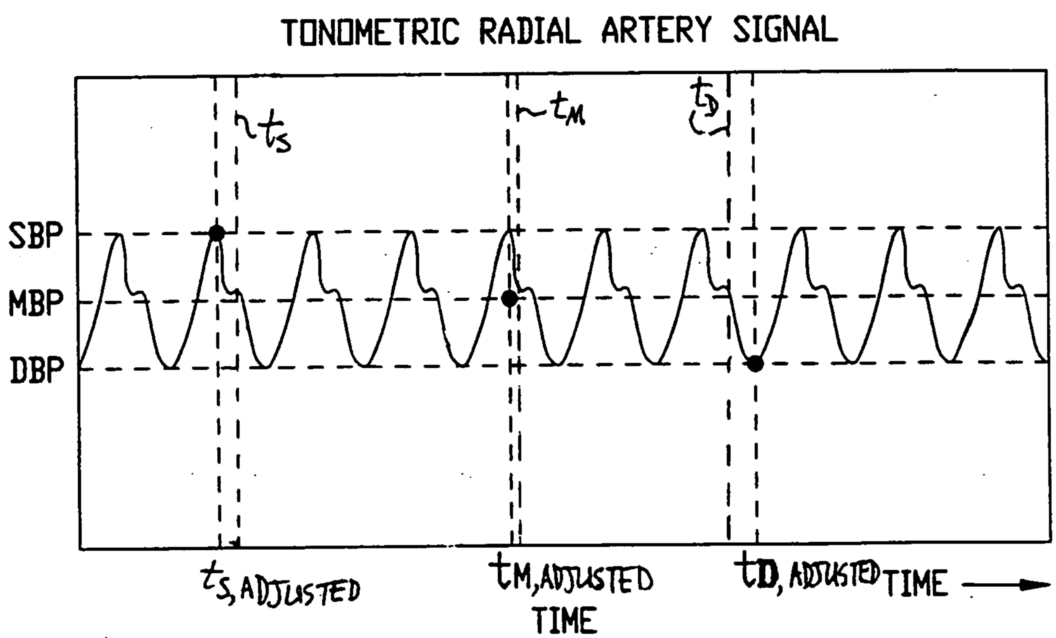
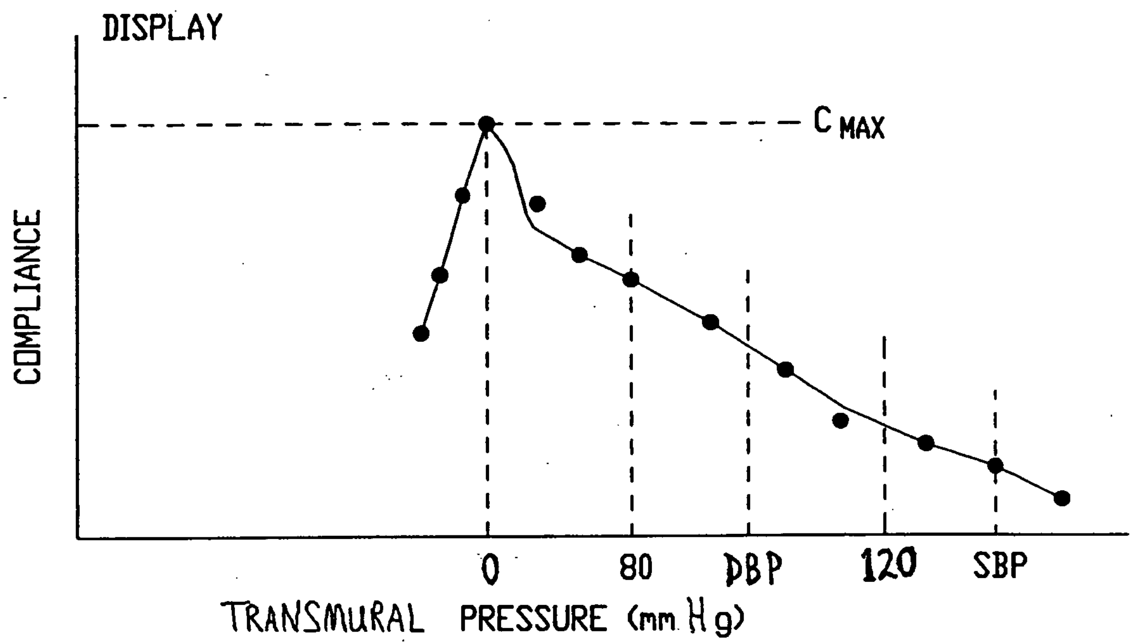

TONOMETRIC RADIAL ARTERY SIGNAL
SBP
MBP
DBP
t_s
t_M
t_D
$t_{S,ADJUSTED}$
$t_{M,ADJUSTED}$
TIME
$t_{D,ADJUSTED}$
TIME

FIG. 2B



COMPLIANCE RANGE: (C(DBP)) to (C(SBP))
COMPLIANCE RANGE
AT NORMALIZED PRESSURE: (C(80)) to (C(120))
MAXIMUM C: (C_{MAX})

FIG. 3

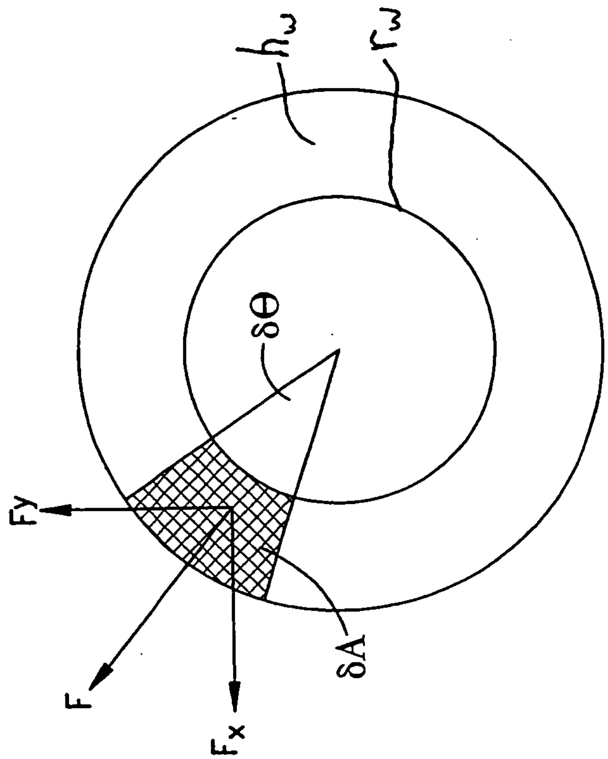


FIG. 4B
(AXIAL SECTION)

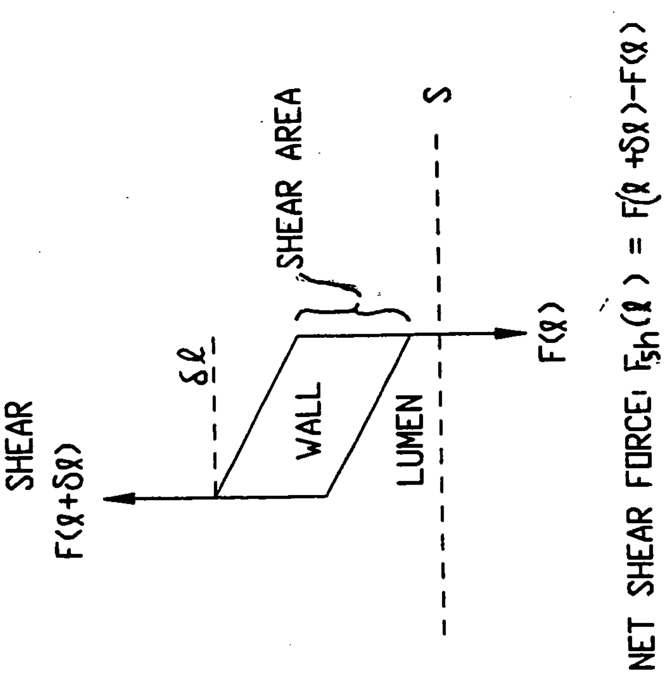
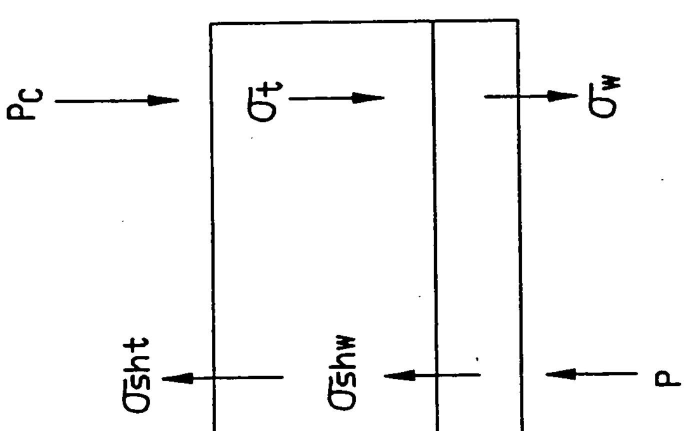
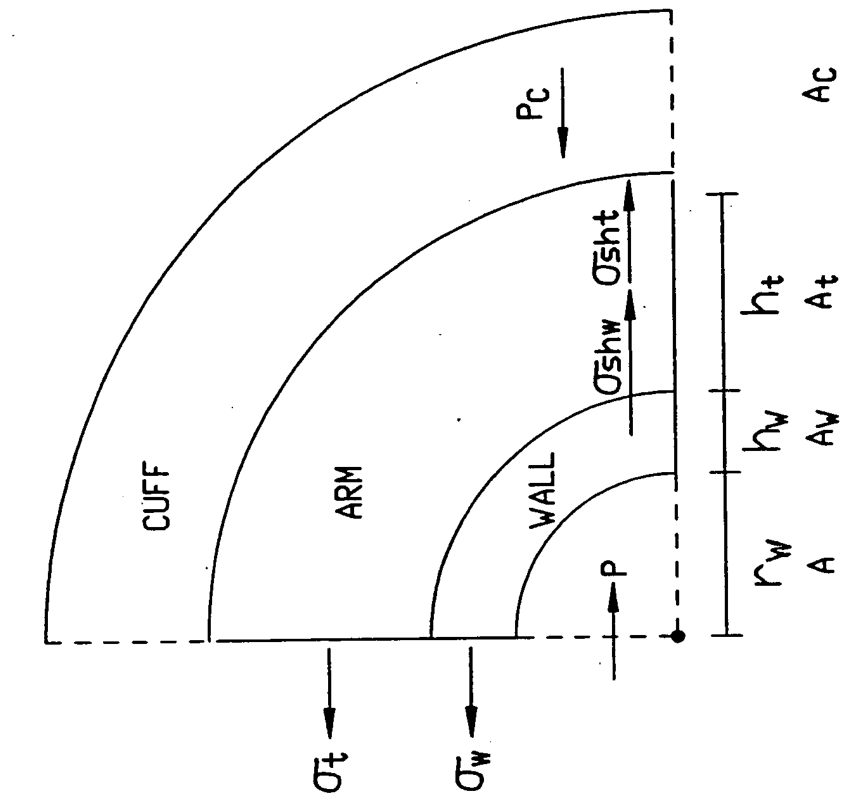


FIG. 4A
(LONGITUDINAL SECTION)



LONGITUDINAL HEMISECTION

FIG. 4C



QUARTER CROSS-SECTION

FIG. 4D

FIG. 5

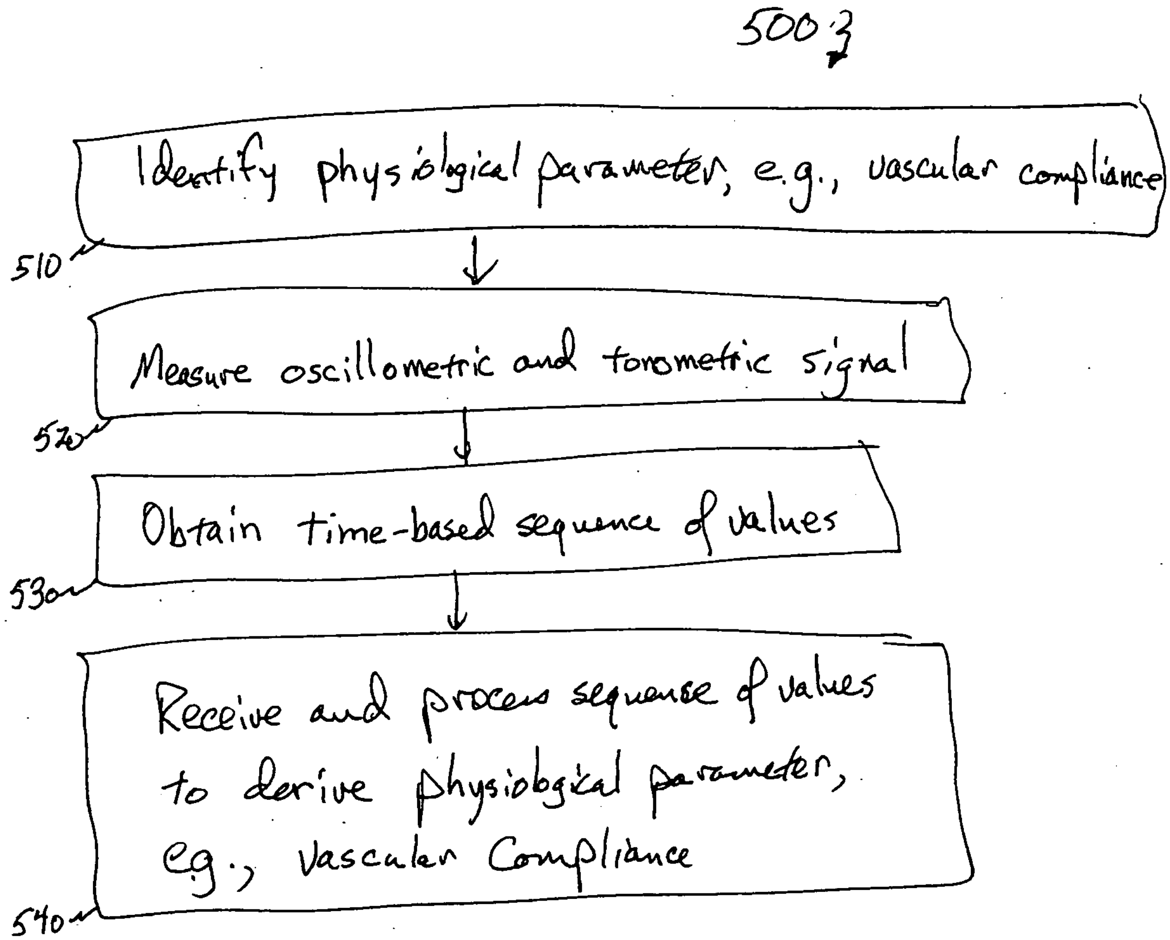

500
Identify physiological parameter, e.g., vascular compliance
510
Measure oscillometric and tonometric signal
520
Obtain time-based sequence of values
530
Receive and process sequence of values to derive physiological parameter, e.g., vascular compliance
540

Figure 6

600

(a) identifying the physiological parameter to be quantitatively monitored and estimated;

(b) measuring an oscillometric signal and a tonometric physiological signal, which signals are quantitatively dependent on a particular value for the physiological parameter;

(c) obtaining a sequence of values that are based on the oscillometric signal and the tonometric signal;

(d) receiving the sequence of values as input signals to a computer system; and

(e) processing the input signals within the computer system to convert the sequence of values to an output signal corresponding to the particular value of the physiological parameter.

(f) using an oscillometric signal to calibrate tonometric pressure signals in a contralateral arterial site.

In some embodiments, a calibrated radial pressure waveform $P_r(t)$ is derived from the tonometric signal $S_r(t)$ as follows:

$P_r(t)=(1/a_r)(S_r(t)-b_r)+ p)$

where $a_r = (S_r(t_D)-S_r(t_M)) / (DBP-MBP)$,
$b_r = S_r(t_M) - a_r$ MBP , and
p= gh are calibration factors, and where
= density of blood,
g = acceleration to gravity,
h = height difference between the oscillometric and the tonometric measurement sites, and is zero if the patient is supine,
MBP is oscillometric mean arterial blood pressure measured at time t_M, and
DBP is oscillometric diastolic blood pressure measured at time t_D.

(g) calculating a first compliance value based on the calibrated radial pressure waveform;

(h) estimating end-effects of the oscillometric signal; and

(i) correcting the first compliance value using the estimated end effects.